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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/936,148  | 09/07/2001  | Takeo Yamaguchi      | NAII-1-17989        | 7918             |
| 26389   | 7590        | 03/25/2005           | EXAMINER            |                  |
| CHRISTENSEN, O'CONNOR, JOHNSON, KINDNESS, PLLC<br>1420 FIFTH AVENUE<br>SUITE 2800<br>SEATTLE, WA 98101-2347 |             |                      | WEINER, LAURA S     |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 1745                |                  |

DATE MAILED: 03/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |   |  |
|------------------------------|--------------------------------------|---|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>09/936,148 | <b>Applicant(s)</b><br>YAMAGUCHI ET AL. |  |
|                              | <b>Examiner</b><br>Laura S Weiner    | <b>Art Unit</b><br>1745                 |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 3-9-05.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-61, 63-83 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-61 and 63-83 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

*W*

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## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments, filed 3-9-05, with respect to the rejection(s) of claim(s) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn and the finality of that action is withdrawn.

However, upon further consideration, a new ground(s) of rejection is made in view of Mushiake (6,242,135).

### ***Claim Rejections - 35 USC § 102***

2. Claims 14-40, 42-47, 49-60, 63-83 are rejected under 35 U.S.C. 102(e) as being anticipated by Mushiake (6,242,135).

Mushiake teaches a solid electrolyte composite where the polymer electrolyte is contained in the continuous pores of a porous polytetrafluoroethylene sheet. Mushiake teaches in column 2, a composite membrane comprising a microporous polymeric sheet having its pores extended from one side to the other where the structure defining the pores being at least partially covered with a functional material such as an organic polymer and the pores of the sheet being at least partially filled with a polymer electrolyte such as ion exchange resin. Mushiake teaches in column 3, lines 20-28, that the microporous polymer films such as polytetrafluoroethylene (PTFE). Mushiake teaches in column 6, line 57 to column 8, line 46, that the ion exchange resins comprise ion-exchange polymeric material which contain ionic functionality preferably sulfonic

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moieties, carboxylic moieties or phosphonic moieties. The functional group will have the structure  $-\text{COOM}$ ,  $-\text{SO}_3\text{M}$  or  $-\text{PO}_3\text{M}_2$  where M is hydrogen, a metallic cation or  $\text{NH}_4$ . The ion-exchange resins can be prepared by general polymerization techniques such by polymerization of a mixture of the major monomer such as PTFE and a fluorinated ethylene containing sulfonyl fluoride group in the presence of a free radical initiator. Mushiake teaches in column 10, lines 44-53, that the composite membrane can be employed in fuel cells, batteries, etc. Mushiake teaches in columns 10-11, Examples 1-2, a solid polymer electrolyte is formed. Mushiake teaches in column 14, example 3 that the membrane can be PTFE and silica.

***Claim Rejections - 35 USC § 103***

3. Claims 14-61, 63-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mushiake (6,242,135) in view of Pintauro et al. (6,365,294).

Mushiake discloses the claimed invention as explained above except for specifically teaching that the fuel cell is a direct methanol polymer fuel cell.

Pintauro et al. teaches in column 1, lines 15-45, that for cation exchange membrane to be used in fuel cells that it must have high ionic (protonic) conductivity, low hydrocarbon fuel cross-over rates (low methanol cross-over for direct methanol fuel cells), etc. Numerous membrane materials have been examined for use in hydrogen/oxygen and direct methanol fuel cells including perfluorosulfonic acid membranes, radiation-grafted copolymers of poly(styrene sulfonic acid) with PTFE, etc.


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It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the membrane taught by Mushiake in a direct methanol fuel cell because Pintauro et al. teaches that these membranes are known to be used in direct methanol fuel cells.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura S Weiner whose telephone number is 571-272-1294. The examiner can normally be reached on M-F (6:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Laura S Weiner  
Primary Examiner  
Art Unit 1745

March 22, 2005